

CLAIMS

WE CLAIM:

- ~~1. A isolated polypeptide selected from the group consisting of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing fragments, and a fusion protein comprising any of the foregoing.~~
- ~~2. The isolated polypeptide of claim 1 wherein the polypeptide is a soluble polypeptide.~~
- ~~3. The isolated polypeptide of claim 1, wherein the PA-binding fragment of SEQ ID NO:2 begins at any amino acid in the range from 27 to 43 and ends at any amino acid in the range from 221 to 321.~~
- ~~4. The isolated polypeptide of claim 1 having an amino acid sequence set forth in SEQ ID NO:2.~~
- ~~5. An isolated polynucleotide or complement thereof, the polynucleotide encoding a polypeptide selected from the group consisting of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing fragments, and a fusion protein comprising any of the foregoing, the polynucleotide being unable to encode SEQ ID NO:6, SEQ ID NO:8 or SEQ ID NO:10.~~
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- ~~6. The isolated polynucleotide of claim 5, wherein the PA-binding fragment of SEQ ID NO:2 begins at any amino acid in the range from 27 to 43 and ends at any amino acid in the range from 221 to 321.~~
- ~~7. The isolated polynucleotide of claim 5 comprising SEQ ID NO:1 from position 104 to 1207 or the complement thereof.~~
- ~~8. The isolated polynucleotide of claim 5 comprising SEQ ID NO:1 or the complement thereof.~~
- ~~9. The isolated polynucleotide of claim 5, wherein the polynucleotide encodes a soluble polypeptide.~~
- ~~10. An isolated polynucleotide or complement thereof, the polynucleotide hybridizing under stringent or moderately stringent hybridization conditions to all or a portion of SEQ ID NO:1 and encoding a soluble, PA-binding polypeptide.~~
- ~~11. A vector comprising a polynucleotide selected from the group consisting of a polynucleotide of claim 5 and a polynucleotide of claim 10.~~
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~~12. The vector of claim 11, further comprising a non-native expression control sequence operably linked to the polynucleotide.~~
- ~~13. A host cell comprising a vector of claim 11.~~
- ~~14. A method for making an antibody, the method comprising the step of: administering to a non-human animal an immunogen, a PA-binding fragment of a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a polypeptide~~

at least 80% identical to any of the foregoing and a fusion protein comprising any of the foregoing.

15. A method for identifying an agent that inhibits binding between protective antigen (PA) and anthrax toxin receptor, the method comprising the steps of:

combining protective antigen (PA) and a polypeptide selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, and a fusion protein comprising any of the foregoing, separately with and without a putative binding-inhibiting agent;

comparing binding between PA and the polypeptide with and without the putative agent; and

identifying a decrease in binding with the putative agent, the decrease being an indication that the test agent inhibits the binding of PA to the anthrax toxin receptor.

16. A method for treating anthrax in a human or non-human animal, the method comprising the step of:

administering to the animal an agent that inhibits binding between protective antigen (PA) and anthrax toxin receptor at a level effective to reduce the severity of anthrax.

17. A method as claimed in claim 16, wherein the agent that inhibits binding between PA and the anthrax toxin receptor is selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, a fusion protein comprising any of the foregoing, a monoclonal antibody, a polyclonal antibody, a polysaccharide, a lipid, and a nucleic acid.

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18. A cultured cell having a cell membrane having an exterior surface, the exterior surface displaying no receptor for anthrax toxin protective antigen.

19. A method for producing an anthrax toxin receptor, the method including the step of: transcribing a polynucleotide that encodes an anthrax toxin receptor operably linked to an upstream expression control sequence, the receptor being selected from the group consisting of SEQ ID NO:2, SEQ ID NO:6, SEQ ID NO:8, SEQ ID NO:10, a PA-binding fragment of SEQ ID NO:2, a PA-binding fragment of SEQ ID NO:6, a PA-binding fragment of SEQ ID NO:8, a PA-binding fragment of SEQ ID NO:10, a PA-binding polypeptide at least 80% identical to any of the foregoing, and a fusion protein comprising any of the foregoing, to produce an mRNA; and translating the mRNA to produce the anthrax toxin receptor.

20. A method as claimed in Claim 19, wherein the polynucleotide is operably linked to the expression control sequence in an expression vector, and wherein the expression vector is delivered into a host cell, the expression control sequence being operable in the host cell.

21. A method as claimed in Claim 19, wherein at least one of the transcribing and translating steps are performed *in vitro*.